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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/910,630	07/20/2001	William A. Huffman	062986.0209	1772

7590   11/23/2004

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EXAMINER
BATAILLE, PIERRE MICHE

ART UNIT	PAPER NUMBER
2186	

DATE MAILED: 11/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	09/910,630	HUFFMAN, WILLIAM A.
	Examiner	Art Unit	
	Pierre-Michel Bataille	2186	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>2</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>05 November 2001</u>.

2a)☐ This action is **FINAL**.   2b)☐ This action is non-final.

3)☒ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-20</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) <u>1-8</u> is/are allowed.

6)☐ Claim(s) _____ is/are rejected.

7)☒ Claim(s) <u>9-20</u> is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 11/5/01 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

       1.☐ Certified copies of the priority documents have been received.

       2.☐ Certified copies of the priority documents have been received in Application No. _____.

       3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

1.   This Office Action is taken in conjunction to examination of the present application under prosecution, which present claims 1-20. Applicant's preliminary amendment filed November 5, 2001 has been considered. New Formal Drawing filed November 5, 2001 have been considered.

2.   The specification has not been checked to the extent necessary to determine the presence of all possible minor errors.

3.   This application is in condition for allowance except for the following formal matters:

Claim 8 recites:

- "a first bit vector which includes *sixteen bits*". While the claim further recites, "wherein the first bit vector is defined by bits N0, N1, N2 and N3" (a **four bit** structure), these two recitations appear to contradict each other.

- "a second bit vector which includes eight bits". While the claim further recites: "wherein the second bit vector is defined by bits N3, N2 and the result of an XOR operation between N4 ad N1" (a **three bit** structure), these two recitations appear to contradict each other.

- "a third bit vector which includes **two bits**". While the claim further recites: "wherein the third bit vector is defined by N4 (a **one bit** structure), these two recitations appear to contradict each other.

- Similarly the recitation, "the second bit vector is defined by N3, the result of an XOR operation between N5 and N2, and N4, and the third bit vector is defined by N5" (**defining a 4 bit structure for the second bit vector and 1 bit structure for the third bit vector**), appears to disagree with previous feature in the claim.

- Similarly the feature, "the second bit vector is defined by the result of an XOR operation between N6 and N3, N5, and N4, and the third bit vector is defined by N6" (**defining a 4 bit structure for the second bit vector and 1 bit structure for the third bit vector**), appears to be inconsistent with previous features in the claim.

- Similarly, "the second bit vector is defined by N6, N5 and N4, and the third bit vector is defined by N7" (**defining a 4 bit structure for the second bit vector and 1 bit structure for the third bit vector**) appears to be inconsistent with previous features in the claim. (See last paragraph of the claims starting "wherein when the number of processor

nodes is between 129 and 256, the processor number is defined by an

eight bit field which includes the seven bit field and an additional bit N7".)

Claim 11:

- It appears that 'a' should be added before "function of the processor

  number".

- The feature, "writing to said first memory location" (paragraph before

  step (a)) appears to be inconsistent with "the line read from the first

  memory location" (step (b)).

- The feature "processor nodes holding a copy of the line" lacks

  antecedent basis in the claim.

Claim 15:

- It appears that "exclosive" should be changed to "exclusive".

4.   Please note that the above defects are merely exemplary. Applicant's

cooperation is requested in correcting any errors of which applicant may become aware

in the specification.

Conclusion

5.   The prior art made of record and not relied upon is considered pertinent to

applicant's disclosure.

Closed related art:

- 6,718,442 (Hoffman et al) teaches directory structure including a bit vector of size v in directory entries (where v=32), each bit representing one or more processor nodes in the system, wherein: for systems with thirty-two or fewer nodes, this size bit vector acts like a full bit vector; for larger numbers of nodes the vector can become "coarse"; and when the set of processor nodes sharing a line is contained within an aligned block of consecutive processor nodes, then the bit vector can still be used as a full bit vector, with another small field in the directory entry specifying the block of processor nodes the vector represents.

- US 6,633,958 (Passint) teaches Multiprocessor computer system and method for maintaining cache coherence utilizing a multi-dimensional cache coherence directory structure.

- US 5,900,015 (Herger et al) teaches system and method for maintaining cache coherency using path directories

- US 5,634,110 (Laudon et al) teaches cache coherency using flexible directory bit vectors

6.   Prosecution on the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.
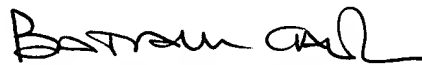
A shortened statutory period for reply to this action is set to expire **TWO MONTHS** from the mailing date of this letter.

7.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pierre-Michel Bataille whose telephone number is (571) 272-4178. The examiner can normally be reached on Mon-Fri (9:30A to 6:00P).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew M. Kim can be reached on (571) 272-4182. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Pierre-Michel Bataille
Primary Examiner
Art Unit 2186

November 15, 2004

PIERRE BATAILLE
PRIMARY EXAMINER